

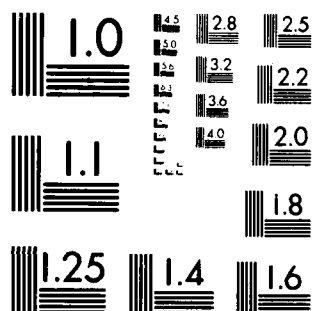
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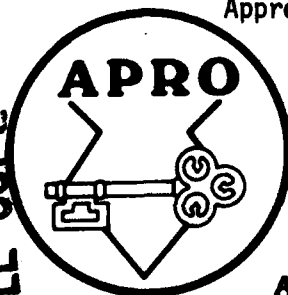
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IMPROVING PRODUCTIVITY AND REDUCING COST  
THROUGH CAPITAL INVESTMENT INCENTIVES.

(10) by  
Wayne V. Zabel  
Duane D. Knittle

(11) Dec 84

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**DEPARTMENT OF THE ARMY**  
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2 February 1981

SUBJECT: Army Procurement Research Office Report APRO 80-07,  
Improving Productivity and Reducing Cost Through Capital  
Investment Incentives

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Inclosed is a copy of subject report for your use. This study explores the relationship between capital investment incentives and productivity, weighted guidelines as a motivator, and the use of other motivating techniques. It includes findings, conclusions, and recommendations concerning government initiatives for encouraging increased capital investment among contractors.

FOR THE COMMANDANT:

A handwritten signature in cursive script, reading "Paul F. Arvis", is positioned above the typed name.

1 Incl  
as

PAUL F. ARVIS, Ph.D.  
Director, US Army  
Procurement Research Office

DRXMC-PRO

2 February 1981

SUBJECT: Army Procurement Research Office Report APRO 80-07,  
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## EXECUTIVE SUMMARY

A. BACKGROUND. Sagging productivity and productive capacity are contributing to cost increases and are jeopardizing the capability of the defense industrial base to meet defense requirements. The Department of Defense (DOD) recognizes that contractor investment in plant modernization could result in increased productivity and cost reduction. The Weighted Guidelines Technique (WGL) for profit determination has been revised to consider profit on capital, and a number of other acquisition techniques and contract provisions are available for use as motivators for contractor capital investments.

B. STUDY OBJECTIVES. The objectives of this study were to determine (1) the relationship between capital investment expenditure levels and productivity; (2) which conditions, if any, preclude WGL's from being a sufficient motivator; (3) the current use and success of multi-year procurement, award fee, value engineering, and special termination buy back provisions as motivators for capital investment; and to recommend alternative strategies and tactics which may be capable of stimulating contractor investment.

C. REPORT RATIONALE. Research began with a literature review of the various initiatives being used to motivate contractor investment. Field visits and interviews were conducted with individuals ranging from policy makers at Department of the Army level to contracting personnel at the major subordinate commands of the US Army Materiel Development and Readiness Command (DARCOM). A model of investment determinants was developed and used as a basis for analyzing contractor and government interactions in the capital investment decision-making process.

D. CONCLUSIONS AND RECOMMENDATIONS. A firm's capital investment decisions are influenced by the firm's operational and nonoperational objectives, and by its internal environment and decision rules. The external environment which provides information needed for decision-making is influenced by the economy and government involvement. Government opportunities for initiatives are somewhat limited, application criteria are rigid, and they are infrequently used within DARCOM activities. The government initiatives are limited in effectiveness by disincentives in the external environment and the short-term orientation of the contracting process. It is recommended that a clear policy on capital investment be articulated and promulgated to the field. Additional training for government personnel should complement any policy issuance to assure uniform implementation. The Army should investigate the possibility of revising Section XV of the Defense Acquisition Regulation to include capital investment aimed at improving a contractor's overall production efficiency as being generally allowable as an indirect cost. The Army should support proposed reforms which are designed to make the business environment and contractual provisions more conducive to capital investment.

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## CHAPTER I

### INTRODUCTION

#### A. BACKGROUND.

The general decline in the United States (US) economy has reached such a point that the public as a whole has begun to sense an urgent need for change. In a land where past generations have counted on steady progression to a better lot, contemporary workers struggle to retain their current positions. The purchasing power of the weekly paycheck has diminished, and many people are forced to rely on past savings to meet current daily requirements. Just as hyper-inflation and the rising cost of food and other items have created budgetary problems for the individual consumer, so have inflation and the increasing cost of military hardware created havoc with the defense budget.

Labor costs, which producers pass along to consumers in the price, are directly related to productivity. Statistics indicate a decline in productivity growth in most industrialized nations, and the US rate of productivity growth is only half the level of twenty years ago. Because of the complicated interrelationships between productivity, cost, and general economics, productivity has become an area of intense concern to the public, US industry, and the federal government.

Many people argue that federal government policies are predominantly responsible, either directly or indirectly, for current economic woes. At the same time, many government policies and functions are impacted by the current economic climate which is influenced by both governmental and private economic decisions. One function that is being seriously impacted by the economy is national defense. Sagging productivity and productive capacity

are jeopardizing the capability of the defense industrial base to meet defense requirements, and the productivity and capacity problems have their genesis in the economy. When, for economic or other reasons, industry fails to invest in modern capital equipment, the existing plants and equipment age and result in decreases in productivity.

The Department of Defense (DOD) recognizes that increased capital investment could contribute to increased productivity and reduced cost in the long run. The following internal programs are available to all appropriated fund activities throughout the Department of the Army (DA) for in-house capital purchases:

1. Quick Return on Investment Programs (QRIP).
2. Productivity Enhancing Capital Investment Program Minor.
3. Productivity Enhancing Capital Investment Program Major.
4. Secretary of Defense (OSD) Funding of Labor Saving Capital Investment Projects.

Although each of these programs is designed for projects involving capital tools and equipment for Army use, they differ according to cost ranges, amortization periods, and appropriation.

DOD also recognizes that external programs such as contractor investment in plant modernization could result in increased productivity and cost reduction. The DOD Profit '76 Study concluded that improved financial incentives for investment in plant equipment were in order, and the Weighted Guidelines (WGL) technique for profit determination was revised accordingly. A number of additional initiatives which could be used to stimulate Contractor concern with production efficiency, plant modernization and subsequent cost reduction are available for DOD use. The special termination buy back provisions of Capital Investment Incentives (CII), Defense Acquisition Regulation (DAR) 3-815,

is an example of one direct method of incentivizing contractors to invest in capital equipment. Other indirect methods available include multi-year contracting, value engineering, and award fee provisions.

Army attempts to use these various initiatives to stimulate contractor investment have resulted in varying degrees of success. Limited successes are largely due to the many factors which affect businesses' willingness and/or ability to invest in capital goods, most of which are working against capital spending. Current tax laws, energy considerations, government regulation, threat of wage and price controls, general uncertainty regarding economic and political developments, and instability of government programs, play interactive roles in the decision process surrounding capital investment.

B. OBJECTIVES OF THIS STUDY.

The first objective of this study was to determine the relationship between capital investment expenditure levels and productivity. The second objective was to determine which conditions (if any) preclude the DOD WGL's profit policy from providing sufficient stimulus for contractor investment. The third objective was to determine the current use and success of multi-year procurement, award fees, value engineering, and special termination buy back provisions as incentives for improving productivity and effecting cost reduction. The last objective was to recommend alternative strategies and tactics which may be capable of stimulating contractor investment.

C. DEFINITIONS.

Some terms are worthy of special mention and definition because of their extensive use in the report.<sup>1</sup>

---

<sup>1</sup>R. F. Williams and D.M. Carr, Contractor Motivation, Army Procurement Research Office, Fort Lee, VA, Draft.

1. Objective - A desired end, implicit or explicit, that is the manifestation of an actual or a perceived need.

2. Motivation - The propensity of an organization to act to satisfy its needs.

3. Motivator or Motive - An objective likely to bring on motivation.

4. Incentive - An action taken by the Government to bring about a desired Contractor behavior, i.e., toward a Government objective.

5. Disincentive - An action that brings about undesirable Contractor behavior, i.e., away from a Government objective.

6. External environment - Those market, technological, economic, scientific, political, and other such factors that are relevant to an organization's (Government or Contractor) success but beyond the organization's control.

7. Internal environment - Those organizational factors that dictate how individuals will react to the external environment. Typically, these are the organization structure, policy and procedure, and make-up and expectations of individuals.

D. REPORT RATIONALE.

1. Report Theory.

In order to fully cover incentives for capital investment, this report must encompass a rather broad array of interactive factors that influence the investment decision making process. The concept of an acquisition technique or a contract provision as a motivator for capital investment must be analyzed in context of many synergistic factors that create an investment environment. For example, a special termination buy

back provision by itself may have to compete with unfavorable tax laws, inflation, high interest rates, and negative corporate policy toward capital investment in general. Therefore, this report will address not only the use and success of government initiatives to motivate investment, it will model the factors which impact investment strategies.

## 2. Research Design.

Research began with a thorough review of recent literature on CII, multi-year contracting, value engineering, award fees, and profit policy. Regulatory and policy guidance issued by DOD and various Army, Navy, and Air Force organizations were then examined. This phase of the research provided insights as to the top level initiatives related to capital investment incentives.

Because the documentary guidance was inconclusive, it was considered necessary to obtain the opinions of individuals ranging from policy makers at DA to policy implementors at Major Subordinate Commands (MSC's). At the Office of the Secretary of the Army, interviews were conducted with representatives of the Assistant Secretary of the Army for Installations Logistics and Financial Management (OASA, IL&FM) and OASA, Research, Development and Acquisition (OASA, RDA). At the DA Staff, an interview was conducted with a representative of the Comptroller of the Army. Headquarters, US Army Material Development and Readiness Command (DARCOM) interviews included representatives of the Directorate for Procurement and Production and the Office of Manufacturing Technology. Field visits were made to obtain the views of project management office and contracting personnel from selected



readiness and development commands.<sup>2</sup> Finally, discussions were held with representatives of the Air Force Systems Command (AFSC) and the Naval Material Command (NAVMAT) to investigate capital investment incentive strategies employed by those organizations.

Based on the results of many interviews, comments and observations, a decision was made to investigate and model the factors which impact government and contractor capital investment positions. This required a review of general literature about investment motivation as well as extensive review of current economic conditions as reported in periodical literature. On the basis of these research efforts, a model of the overall concept of capital investment was constructed. As the purpose of this model is to serve as a vehicle for understanding the interrelationship between objectives and conditions within the environment, it is somewhat simplified. Government policies and practices were analyzed in the context of this model. Based on this analysis, areas needing improvements were identified. Selective recommendations to effect these improvements were formulated.

### 3. Report Organization.

This chapter of the report is important as an avenue for framing the substantive chapters which follow.

Chapter II presents a graphic model of the factors influencing capital investment.

Chapter III is a discussion of current environmental conditions which influence capital investment.

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<sup>2</sup>US Army Missile Command, US Army Communications and Electronics Materiel Readiness Command, US Army Communications Research and Development Command, US Army Electronics Research and Development Command, US Army Troop Support and Aviation Materiel Readiness Command, US Army Aviation Research and Development Command, US Army Tank-Automotive Materiel Readiness Command and US Army Tank-Automotive Research and Development Command.

Chapter IV analyzes the realities of Government attempts to stimulate contractor investment in capital through contract provisions and techniques.

Chapter V contains conclusions and recommendations.

## CHAPTER II

### MODELING CAPITAL INVESTMENT DETERMINANTS

#### A. INTRODUCTION.

This section of the report describes a model of the many interrelated factors that influence the capital investment decision making process. Figure 1 is a model of the contractor motivation process that was developed under an earlier research study.<sup>3</sup> This model will provide a basis for discussion of the objectives and environments faced by both the government and industry in the particular context of capital investment strategy. When the relevant objectives and environments have been presented, the section will conclude with the model for capital investment determinants.

#### B. OBJECTIVES AND ENVIRONMENTS.

##### 1. Contractor's Objectives and Environments.

Figure 1 depicts a relationship between the government and the contractor. Each party to this relationship has its own prioritized objectives. Contractors have many objectives which are so general and non-operational in nature that they are often taken for granted. Such objectives could include survival, stability, growth, and profit. Other objectives, operational in nature, could include maintenance of reputation, avoidance of technical obsolescence, control of current expenses, and obtaining contracts. Although contractors often have a much wider variety and number of operational objectives than indicated here, it is apparent that satisfaction of the listed operational objectives might require capital investment considerations.

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<sup>3</sup>

Williams and Carr, Contractor Motivation, p. 14.

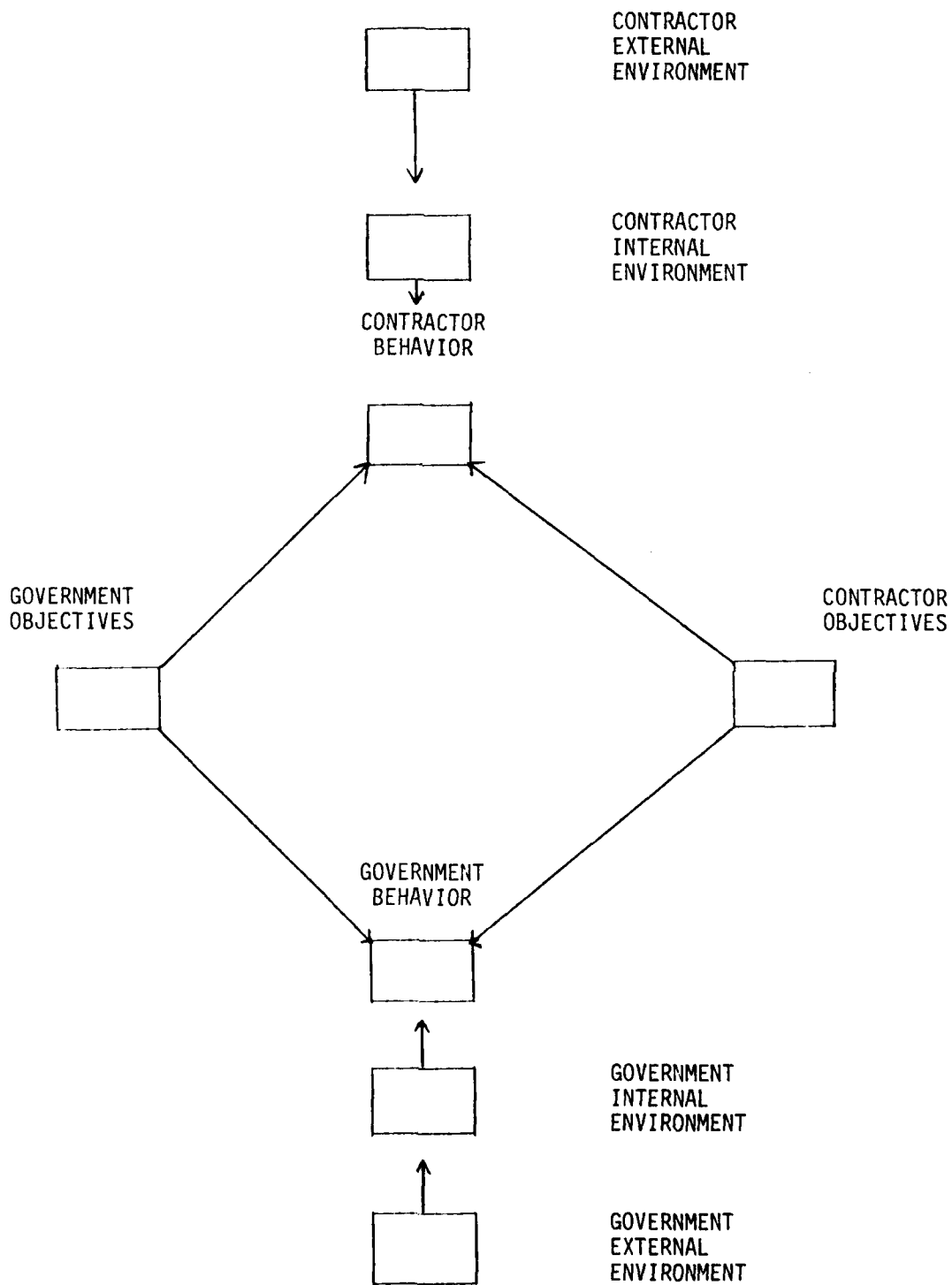


FIGURE 1. CONTRACTUAL EXCHANGE RELATIONSHIP

Contractor behavior directed toward the satisfaction of operational objectives is certainly influenced by the environment within which the contractor exists. This total environment can be dissected into internal and external environments.

The internal environment could consist of very formal ingredients (e.g., corporate policy, organizational framework, business practices and policies, etc.). Informal ingredients may be just as pervasive (e.g., a manager's personal preference, an employee's attitude, etc.). The internal environment provides a basis for development of various decision rules which are used to determine actions to be taken under specific circumstances. For example, a decision rule could be developed to determine the deployment of resources among human or capital categories.

The contractor's external environment consists of everything that goes on outside the business itself. The external environment consists of the market condition, economic or political climate, government policies and regulations, etc. Information provided by the external environment contributes to the decision making process, and at times such information could be the most influential of all the contractor's considerations. For example, a new set of rules from the Environmental Protection Agency (EPA) or the Occupational Safety and Health Administration (OSHA) could affect the contractor's strategic planning for 5 to 10 years. Such areas as capital budgeting, product line planning, financial schedules, market position, and return on investment can be affected by a change in governmental regulation.

## 2. Government Objectives and Environments.

The government operates under a diversity of objectives just as contractors do. For ease in this study, government objectives will be

considered as falling into two categories, extra contractual and contractual.

Extra contractual objectives are very broad and could include a vast array of activity directed toward achieving or maintaining certain social or economic standards. For example, the provision of national defense is a function which enables the populace to continue to enjoy personal freedom (e.g., freedom of speech, religion, etc.). However, personal freedom is also furthered by social policies (e.g., equal opportunity, affirmative action, preference for small business or US made goods). Likewise, the exercise of fiscal and monetary policy is designed to manipulate the economy in a desirable fashion.

Contractual objectives are much smaller in scope than social or economic (extra contractual) objectives; however, their satisfaction contributes to the achievement of the basic purpose of government. Contractual objectives normally include cost, technical requirements, schedule, and other considerations. Various strategies and tactics are used by the government to achieve the contractual objectives.<sup>4</sup> If cost reduction or control is a high priority, the government could utilize competition, multi-year contracting, cost incentives, or other acquisition techniques or contract provisions to achieve the desired effect on cost.

The government operates within environments just as the contractor does. The internal environment of a contracting activity consists of its organizational structure, manpower, acquisition policies, etc. The external environment for that same activity consists of public expectations and the effects of rules and regulations (policies) of other government agencies.

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<sup>4</sup>R.F. Williams and Wayne V. Zabel, Relating Contracting and Acquisition Planning, Army Procurement Research Office, Fort Lee, VA, 1979.

Just as the contractor's operational objectives are influenced by its external environment, so is the contracting activity's objective affected by the government external environment. Many contracts, for example, are for end items which require some amount of forging during the manufacturing process. Because of EPA and OSHA regulations and various other government policies, the forging industry has declined to such an extent that lead times for forging have become bottlenecks affecting the delivery schedule of entire systems. Additionally, those foundries which remain open have had to make substantial investments in pollution abatement equipment which generally does not add to productivity. As the business invests in this non-productive capital expenditure, it uses funds which could have been otherwise used for productivity improving capital investments. Therefore, the contract cost is higher because the contractor passes on the indirect cost to the government in its price, and the delivery schedule is drawn out because of back order or capacity shortage.

C. CAPITAL INVESTMENT DETERMINANTS.

1. Introduction.

Figure 2 is a model of the overall concept of the capital investment decision making process. In order to see how the factors interact in this model, an example will be provided. The assumptions will be as follows:

- a. The contractor's objective is to obtain a specific government contract with the knowledge that cost is a very important consideration to the government as well as performance.
- b. The government's objective is to award a contract with an optimum balance of cost, technical and schedule considerations.

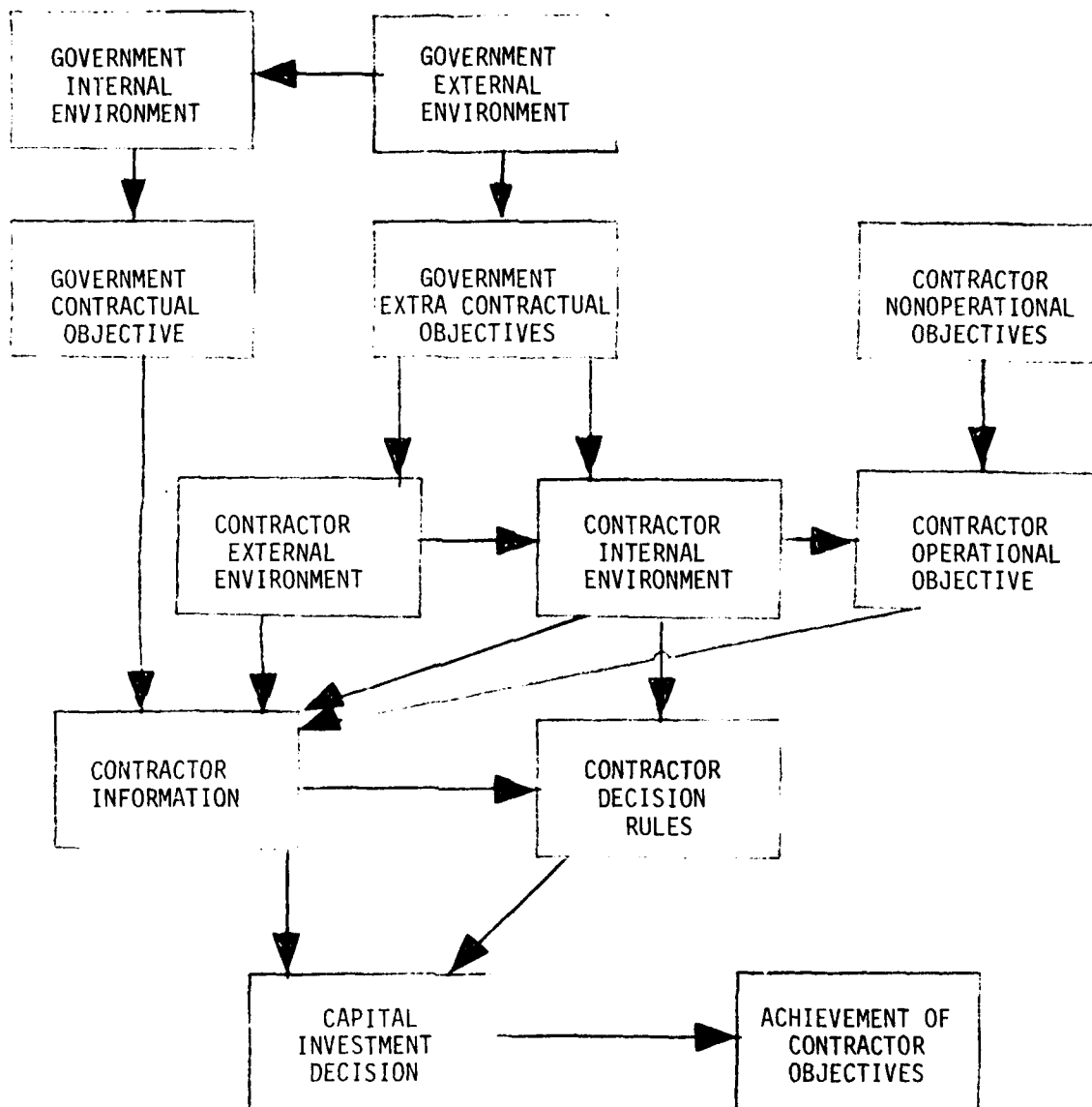


FIGURE 2. CAPITAL INVESTMENT DETERMINANTS MODEL



## 2. The Contractor's Perspective.

A contractor can offer an attractive cost by being aggressively optimistic (buying-in), exercising manufacturing efficiency, controlling indirect expenses, or any other number and combination of courses of action. Manufacturing efficiency might be the preferred alternative. One method of being efficient in manufacturing is to use productivity improving capital assets. The contractor may not have a sufficient amount of these types of assets; however, he does not simply go out and acquire them. The decision to invest in capital is based on available information and various decision rules. A decision rule for investment might be that a capital investment will only be made for a certain level of Return on Investment (ROI). In order to estimate the ROI, the contractor's information must include such economic considerations as:

- a. availability of credit
- b. interest rates
- c. tax impact
- d. depreciation
- e. inflation
- f. amortization

Other factors to consider would be:

- a. long term capital budgeting program
- b. market position
- c. impending government regulations
- d. lead time for capital assets
- e. future value of assets at end of current contract

When the factors are such that capital investment is unacceptable, other alternatives must be sought by the contractor to meet the target of manufacturing efficiency. Such alternatives could include:

- a. substitute inexpensive human labor
- b. subcontract portions of the requirement
- c. consider options other than manufacturing efficiency to meet objective.

It must be emphasized that capital investment is not used on every occasion, but is only one of a number of alternatives.

### 3. The Government Perspective.

In this instance, the contractual objective is to acquire a product within certain schedule and cost constraints. Under certain conditions, the government can expect competition to control costs and manufacturing efficiencies. At other times the government may use a variety of contractual provisions to encourage contractor cost control and manufacturing efficiency. It must be remembered, however, that in addition to the contract provisions the contractor obtains information from his external environment. Regardless of how attractive an incentive a contract provision might appear to be, economic and/or other factors may be disincentives. Special termination buy back provisions provide a contractor with a substantial reduction in risk due to government commitments of program stability. However, lack of funds and high interest rates will render the investment strategy moot. Simply put, satisfaction of contractual objectives is dependent not only on the contractor's desire to cooperate, it is dependent on the contractor's external environment which is significantly influenced by government extra contractual objectives.

### CHAPTER III

#### CURRENT STATE OF THE CONTRACTOR'S EXTERNAL ENVIRONMENT

##### A. INTRODUCTION.

The model of investment determinants presented in Chapter II indicates that contractor's investment decisions are based in part on information from their external environment. Such information consists of the basic economic climate and conditions, and other non-economic ingredients which directly or indirectly impact the contractor's business. Economic areas could include the general health of the economy, investment funding availability, and depreciation and tax related issues. Non-economic considerations could include government involvement and the condition of the contractor's market. This chapter will discuss the current state of this environment.

##### B. THE ECONOMIC PORTION OF THE ENVIRONMENT.

###### 1. Overall Economic Climate.

Although the average American citizen is unfamiliar with the intricacies of the business cycle, fiscal or monetary policies, most people will agree that the economy is not in the best shape the Republic has ever seen. The 7.8 million people currently unemployed<sup>5</sup> are acutely aware of the current economic climate, however, all individuals and businesses are affected financially and psychologically by an economy that wavers between recovery and renewed recession. The devastating effects of persistent high inflation teamed with stop-and-go economic policies undermine the ability of business to plan investment projects. Inflation and government attempts to control it have

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<sup>5</sup> Judith B. Gardner, Kenneth R. Sheets, and Harry A. Lenhart, Jr., "Election Impact on Business," U.S. News & World Report (Nov 10, 1980): 24.

affected prices, wages, taxes, savings and so many other aspects of the economy that concern over inflation currently prevails over concern about unemployment. The impact of inflation is so pervasive and interactive in the current economic climate that its effects will be seen in each of the subsequent economic areas discussed in this section of the chapter.

## 2. Investment Funding Availability.

### a. General.

A contractor basically has two sources for funds to be used for capital investment, internal and external. The internal source of funds consists of profits and retained earnings, depreciation and the investment tax credit. Funds acquired from sources external to the company result from the incurrence of a debt or from equity capital.

### b. Internal Funding.

(1) Profits and retained earnings. Most people would agree that as a business prospers it should invest a portion of its earnings into capital assets to continue prospering at an increasing rate. "According to Commerce Department calculations, aftertax corporate profits based on traditional accounting measures rose 485% during the three decades from 1950 to 1979 - a linear compound annual growth rate of 13.1%.<sup>6</sup> Although this growth rate appears encouraging and capable of providing investment funds, inflationary impact has camouflaged a dismal actual growth rate. If adjustments are made for underdepreciation and the higher cost of replacement of inventory, the annual growth rate is reduced to 7.4%. By

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<sup>6</sup>

"Inflation Skews The Profit Incentive," Business Week (June 30, 1980): 72.

considering the erosion of the dollars' purchasing power from inflation, the annual growth rate can be further reduced to 2.6% or an increase of 105.1% during these three decades. The current recession has further complicated the profit scene because business profits in the second quarter of 1980 fell to approximately the level of fourth quarter 1977 profits. High interest rates, vigorous inflation, squeezed consumer purchasing power, and cost pressures are likely to hold profits below last year levels for several additional quarters.<sup>7</sup> This bleak picture of poor profits indicates that many corporations have difficulty paying dividends to shareholders, developing and marketing new products, and simultaneously financing essential investment in new plant and equipment. Although the steel industry's difficulties are complicated by problems in the auto industry, it can be used as an example. Steel production in the US at the end of WW II exceeded the total of all non-US steel production combined. Today, all Americans are familiar with the problems in the US steel industry. US Steel Corp. and Bethlehem Steel Corp. each have closed a number of plants in the last several years. The plants were closed because they needed major capital investment to modernize and add pollution controls. The corporations closed the plants, yet averaged dividends of 72% and 83% of earnings respectively over the last five years. Such dividends leave little for modernization.<sup>8</sup> Third quarter statistics for 1980 indicate that the US steel industry lost \$32.8 million.<sup>9</sup> The payment of large dividends in the short run at the sacrifice of

<sup>7</sup>"Comeback In Profits-Will It Last?" US News & World Reports (Nov 10, 1980): 93.

<sup>8</sup>"Plants That Are Not Kept Up To Date," Business Week (June 30, 1980): 74-75.

<sup>9</sup>"Comeback In Profits-Will It Last?" p. 93.

reinvestment and long run planning is not peculiar to the steel industry; and perhaps the impact of short-term decisions on allocation of earnings is contributing to long-term profit decline across the board.

(2) Depreciation and taxes.

(a) Depreciation. Depreciation accounting is a system of accounting which aims to distribute the cost or other basic value of a tangible capital asset, less salvage (if any), over the estimated useful life of the asset in a systematic and rational manner.<sup>10</sup> Depreciation is a way to lessen tax liability because a contractor can deduct from its income the cost of a depreciable asset when computing federal income taxes. Depreciation allowances are supposed to allow firms to generate the cash they need to invest in new machinery. The trouble is that existing allowances are based on the original purchase price of the asset, and inflation has raised replacements costs considerably.

There are several depreciation methods acceptable for tax purposes; straight line, sum of the years' digits, and double declining balance. Accelerated depreciation, which includes each method but straight line, reduces taxes in the earlier years of an asset's life because the deductions are largest in the early years and decline each succeeding year. By using accelerated depreciation methods, contractors therefore have more cash available for investment in the earlier years.

(b) Investment tax credit. Current tax laws provide a 46% tax rate for all corporate income over \$100,000. In order to encourage investment, the federal government recognizes an investment tax credit (ITC)

<sup>10</sup>Howard W. Wright and James P. Bedingfield, Government Contract Accounting, Government Contract Texts, vol. 3 (Wash, DC: Federal Publications Inc., 1979), p. 70.

which could reduce tax liability for the purchaser of capital equipment. The ITC varies according to the expected life of the asset (i.e., 7 years or more = 10% credit of purchase price; 5 years or more, but less than 7 = 6.66%; 3 years or more but less than 5 = 3.33%). Whereas a tax deduction lowers adjusted net income on which taxes are computed, the ITC reduces tax obligation dollar for dollar.<sup>11</sup>

The ITC has been subject to fluctuations since it was enacted at 7% in 1962. It has been repealed and reinstated several times, and finally liberalized at 10% and made permanent in 1970.<sup>12</sup> Since the ITC has been made permanent, businesses have a more predictable base for making investment decisions.

(c) Tax reform. Although there are many tax reform proposals in the wind, any changes enacted will most likely involve a liberalization of both depreciation and the ITC. The most discussed proposal for depreciation reform has been the Conable-Jones "10-5-3" plan which includes ITC reform. "10-5-3" refers to depreciation categories for all assets: 10 years for buildings, 5 years for equipment, and 3 years for cars and light trucks. The plan also provides for a full 10% ITC for assets in the five year bracket in lieu of the current 7 year requirement.<sup>13</sup> Although tax reform is desperately needed and highly likely to occur, it is a very political and complicated issue. The two largest problems facing congress in this area are how to allocate the tax reform between business and personal income and how to compensate for the

<sup>11</sup> Gilbert Held, "Why Taxes Matter in Selecting Equipment," Data Communications (August 1980): 64.

<sup>12</sup> "The Tonic Role of New Tax Policies," Business Week (Jun 30, 1980): 128.

<sup>13</sup> Sidney Kess, "Stop! Think About Capital Spending Before Year-End," Boardroom Reports 9 (October 20, 1980): 13.

loss of revenue while preventing inflation. Because of these problems there has been much talk and little action, and investment planners have decided to defer investments until the reform has been enacted. In fact, it is not unusual for consultants to advise business' to defer new investments until early in 1981 because tax legislation is expected to be retroactive to January 1981.

c. External Funding.

(1) Debt. Contractors with insufficient internal funding capability must borrow money to meet capital investment requirements. The ability to borrow money, however, is dependent on interest rates and the amount of money available in the banking system for loan purposes. The latter results from personal savings.

(a) Personal savings and the rate of investment. Personal savings as a percentage of disposable income is considerably lower in the US than in other industrialized nations such as the United Kingdom, France, West Germany, Italy, Japan, and Canada. While the saving rate in the US hovers around 6% (it went as low as 3.4% in early 1980), the savings rate in Japan and West Germany averages about 20% and 14% respectively.<sup>14</sup>

It is interesting to note that although the rates are not exactly proportional, countries that tend to save more, tend to invest to a larger extent. Of the industrial nations listed earlier, each experience greater investment as a percentage of Gross National Product (GNP) than the US except for the United Kingdom. During the last 15 years US investment

<sup>14</sup>

Steve Hart, "An Erosion of Saving," Business Week (June 30, 1980): 61.



in plant and equipment as a percentage of GNP averages 7.5%; West Germany averaged 8.8%; and Japan exceeded 17%.<sup>15</sup>

There are many economic and social reasons for the low rate of saving in the US. Economic reasons for low savings rates include wasting away of savings by inflation, low interest rates on savings, taxation of interest earned on savings, and declining after tax income available for savings after living expenses are met. Consumer prices rose by 13% in 1979, while personal income increased by an average of about 11%.<sup>16</sup> With gasoline selling for an average of about \$1.20 a gallon, and hamburger about \$1.95 a pound, consumers are being squeezed. Although competition and technology have kept prices of some products down (calculators and color TV's) most "essentials" have increased in price. While wages have increased, double-digit inflation has forced individuals into higher tax brackets. This leaves less money available out of any increases in wages to meet the continued inflationary pressure from food, housing, energy, and other prices not affected by the current recession. During periods of high inflation, people tend to continue to purchase goods before the prices rise further even if they have to borrow against the future to pay the bill. The logic is that the debt will be repaid with cheaper dollars. Economists argue that such action will cause overextension, a drop in purchasing and an ultimate recession with moderation in prices. However, the recession that began early in 1980 has done little to slow inflation. In addition to these economic reasons for the low savings rate there also exists the social reason that

<sup>15</sup>  
Ibid.

<sup>16</sup> Harry Anderson, et al., "Is US Inflation Out of Control," Newsweek, (3 March 1980): 55.

Americans tend to be consumption-oriented. The American worker is among the most prosperous in the civilized world and believes in a basic entitlement to the conveniences available in the market place. The "keeping up with the Jones'" syndrome contributes to much conspicuous consumption.

(b) Interest rates. The rate of savings and investment is related to the interest that is paid on savings and the interest that is charged when money is borrowed. There is little that can be said about interest rates for savings. Government regulations hold interest rates on savings well below the rate of inflation while the Internal Revenue Service taxes all but the first \$100 of interest "income" at the full personal-savings rate.<sup>17</sup> In addition, the current level of inflation causes real after tax rates of return on savings to become negative. The cost of borrowing money, on the other hand, deserves some comment. As a result of tight monetary policy and rising inflationary expectations, the prime interest rate banks charge their best corporate customers peaked at 20% in April 1980 and has been subject to fluctuations since that time. Capital spending plans are curtailed when the cost of borrowing money is high, the interest rate situation curbs consumer demand, or when the interest rate is subject to wide fluctuation and business people are unsure about the direction the rates are headed. The current economic climate provides all three of these interest conditions.

(2) Equity. Equity or stock represents ownership in the corporation as compared to debt which is simply a contractual lending

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<sup>17</sup> Harry Anderson, et al. "The US Productivity Crisis," Newsweek (Sep 8, 1980): 56.

arrangement. Although equity capital certainly represents an external source of funds for a corporation, a decision to pursue such funding is governed by the articles of incorporation (an internal environment factor rather than external).

C. THE NON-ECONOMIC PORTION OF THE ENVIRONMENT.

1. Government Involvement.

Although government economic policies are receiving the greatest amount of attention at this time, there are many other government actions which shape the external environment of the contractor. Deficit spending has bled away funds from the private sector and contributed to inflation; the increasing complexity of social programs has also diverted funds; and government intervention in business in general has been transformed from a relatively uncomplicated type of economic regulation to a program directed at affecting the behavior of a whole society.<sup>18</sup>

Social goals such as a cleaner environment, a safer workplace, and equal employment are broadly accepted as beneficial to society. However, the fact that many of the policies aimed at achieving these social goals are contradictory detracts from public confidence in government. One needs only to look at energy to see an example of such contradictory policies. The Department of Energy (DOE) is eager for industry to switch from oil to dirtier coal while the EPA is pushing for cleaner air; the Department of Transportation (DOT) wants automobile weight reduced to contribute to fuel economy while the National Highway Traffic Safety Administration (NHTSA) requires automobile manufacturers to add safety equipment to autos which

<sup>18</sup>

Irwin L. Kellner, "The Manufacturers Hanover Economic Report," (NY: Manufacturers Hanover Trust Co., (August 1980)).

increases the weight; DOT tries to keep coal rail rates high to help the rail industry while DOE wants rail rates to be kept low to encourage plant conversion to coal.<sup>19</sup> In addition to contradictions, contractors argue that there are duplications, jurisdictional disputes, excessive reporting requirements and tremendous overhead costs involved in dealing with the federal bureaucracy.

The net effect is that excessive government involvement has caused a loss of confidence in government in general and an increase of investment requirements for satisfaction of social goals which do not necessarily promote production efficiency.

## 2. Contractor Market Position.

Although decision rules are generated within the contractor's internal environment, the contractor's market position often has an influential effect. For example, the amount of competition from other producers of the same commodity will influence capital investment. In a highly competitive environment, an individual contractor is forced by the market to invest in new machines to remain efficient and price competitive. On the other hand, a monopolist can afford to be inefficient because of the lack of threat of competition. The mixture of commercial and military peculiar products will also require a strategy for allocation of corporate investment funds. This portion of the external environment will be different from contractor to contractor.

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<sup>19</sup>

Ibid.

D. SUMMARY.

This chapter has addressed a number of issues which have a direct bearing on the contractor's need, willingness, and ability to invest in capital equipment. Unfortunately the current economic climate is not conducive to large expenditures of money for capital asset acquisitions. More importantly, historical data indicate a trend of diminishing savings and investments prior to our current economic problems. Also, the increasing amount of government involvement in the attempt to further social goals has necessitated investments which do not contribute to efficiency yet drain a contractor's ability to invest in productivity-improving capital assets.

CHAPTER IV  
THE REALITY OF  
CAPITAL INVESTMENT MOTIVATION

A. INTRODUCTION.

Much of the capital equipment used to produce weapon systems and materiel for the DOD is more than twenty years old. New investment by contractors and the government has not kept pace with the advances in manufacturing technology which lead to higher productivity and lower costs. Although ideas such as these are on the minds of many people, and recent thrusts are being made to "reindustrialize America," this is not a new problem.

On 31 May 1975, DOD established "Profit 76" to examine the profit policy for military contracts. The ultimate goal was to develop an improved policy which would encourage industry to invest in modern plants and equipment which would reduce the acquisition cost of weapon systems and materiel.

On 4 Dec 1975, DOD initiated a "Capital Investment in Defense Business" study as a corollary to the "Profit 76" study. The investment study was to examine factors other than profit which influence industry's decision to invest in modern facilities.

B. PERCEIVED DOD CAPITAL INVESTMENT POLICY.

As a result of DOD studies in capital investment and profit policy, DOD composite policy on capital investment is perceived to be as follows:

1. Investment in capital equipment will cause a contractor to be more efficient and will contribute to a reduction in cost.

2. Weighted Guidelines (WGL) will motivate contractors to invest in several ways:

- a. A percentage of the profit is based on the amount of capital employed in the instant contract.

b. A special profit factor for productivity will compensate contractors for the reduction in the cost base for follow-on contracts which experience productivity improvements.

3. Although not a profit factor, the imputed cost of capital has been recognized as a direct cost with the promulgation of Cost Accounting Standard (CAS) 414.

4. In those instances where investment is not sufficiently stimulated by WGL, the following initiatives will be used to motivate capital investment:

- a. Special Termination Buy Back Provisions.
- b. Value Engineering (VE).
- c. Award Fee Contracts.
- d. Multi-year Contracting.

This chapter will address the reality of capital investment motivation within the DARCOM community.

C. INVESTMENT LEVELS AND PRODUCTIVITY.

DOD profit policy is based on the premise that contractor's investment in modern facilities will improve productivity and reduce cost. The special profit factor for productivity on the WGL (DD Form 1547) form was thought to be a source of data to confirm the relationship between specific investments and productivity improvements. Unfortunately, the Army has experienced no use of the productivity reward on any of its contracts. While personal interviews with pricing personnel at the field installations visited confirmed that they believe capital investment and productivity improvement are inseparable, they had no tangible evidence of past productivity rewards at their respective commands.

Although data could not be located to quantify productivity improvements on specific contracts because of capital investment by the contractor, the literature search did reveal statistics which address productivity improvement rates and other statistics which address investment levels. The long-term rate of growth in productivity in the US has fallen from 4.2% in 1960 to 2.1% in 1979.<sup>20</sup> Other industrialized nations have also experienced decreasing rates of long-term productivity growth; however, all but the United Kingdom continue to enjoy a higher rate of productivity growth than the US. As the same time, the level of US investment as a percentage of GNP (as indicated in Chapter II) has been lower than that of all other industrialized nations except for the United Kingdom. Even though productivity growth is influenced by factors in addition to investment levels, the coincidence of these statistics cannot be ignored.

D. PROFIT ON CAPITAL.

As a result of the "profit 76" study recommendations, revisions to the DOD profit policy were announced in the Defense Acquisition Circular (DAC) 76-3, and subsequently revised in DAC 76-12. The major revisions concerned the recognition of facility investment both as a basis for profit and as an allowable cost.

The weight range for the facilities capital investment factor was initially established as 6 to 10%. Various studies and reviews subsequently indicated that this weight for the facilities investment factor was so modest that it did not constitute a major criteria in contractors investment decisions. Financial personnel also agreed in various interviews that they observed no meaningful impact from the DAC 76-3 policy. They attributed the lack of

<sup>20</sup>Merrill Sheils, et al, "An Economic Dream in Peril," Newsweek (8 September 1980): 52.



contractor motivation to the small percentage of profit allocated to capital employed and the current economic climate.

The profit policy was revised again in DAC 76-23 to raise the weight range to 16 to 20% and change the DD Form 1547 format and content.

Although it is widely accepted that the higher contribution of capital investment to the total profit objective will do more to motivate investment, several conditions remain which should be addressed:

1. WGL is currently, and always has been, cost based. As long as a contractor's profit is based on cost, there will be a disincentive for investment (i.e., although the percentage rate of profit may not change, increased productivity should be reflected in decreased cost, and consequently decreased profit dollars). This is especially true when the productivity reward is not being used to offset the reduced cost base profit allowance.

2. WGL applies to individual contracts while investment decisions affect years of contractor experience. The commands, Defense Contract Administrative Service (DCAS), and Defense Contract Audit Agency (DCAA) were unable to provide any historical data about investment trends and levels of productivity at the contractor level. Investments are considered at the contract level and rolled up into an aggregate amount by type of contract, military department or other criteria. This data will not portray fluctuations in investments at the contractors level, and the absence of such data makes meaningful assessment of the effect of the revised WGL emphasis virtually impossible.

E. SPECIAL TERMINATION BUY BACK PROVISIONS.

1. Introduction.

With the knowledge that the new profit policy might not always be a sufficient motivator for capital investment, DOD implemented special capital investment incentive provisions under the Defense Acquisition Regulation (DAR),

DAC No. 76-11 revised the DAR to include sections 1-213, Capital Investment by Contractors, and 3-815, Capital Investment Incentives. DAR 1-315 states that it is DOD policy to encourage contractor capital investment for efficient capability in development and/or production of weapon systems and materiel; and DAR 3-815 provides one of the techniques used to support this policy.

2. Technique.

The special termination buy back provisions of DAR 3-815 provide a reduction of contractor risk for capital acquisitions by application of a guaranteed purchase provision. Under this provision, the contractor agrees to purchase certain specified capital assets on the assumption that the government will purchase a given number of items over a set time period. The government then guarantees the contractor that the government will buy the capital assets from the contractor at no more than the depreciated value if the planned acquisition does not occur. The planned acquisition program provides a basis to develop criteria as to when the clause can be invoked, and the conditions of the government's contingent liability.

Guidelines for use of the technique include the following:

- a. The program the provisions are to be used on must be listed in the Five Year Defense Program (FYDP) and must be designated as a Defense System Acquisition Review Council (DSARC) program.
- b. The contractor must be unwilling to acquire the capital under any other conditions; the investment is vital to meet production milestones and delivery schedules; and the capital will provide cost reducing benefits to the government.

c. Capital assets covered under the investment clause shall include only severable industrial plant equipment (IPE) with a unit value in excess of \$10,000.

d. The contractor must be in compliance with CAS 404, Capitalization of Tangible Assets, and CAS 409, Depreciation of Tangible Capital Assets.

e. The contract clause must include:

(1) A list of the nomenclature and value of each item of plant equipment covered.

(2) The dollar ceiling of the value of covered items as well as the government's contingent liability by fiscal year.

(3) Criteria for invoking the clause.

(4) A provision that the investment clause shall be carried over to successor contracts until the government's responsibility to acquire the equipment expires.

3. Army Use of Special Termination Buy Back Provisions.

a. General.

The Army has used or attempted to use the DAR 3-815 special investment incentives on the XM1, Viper Carborane production program, and the Fighting Vehicle System (FVS).

b. XM1.

The XM1 program was reviewed in August 1977 to investigate the possibility of using the DAR 3-815 provisions. It was recognized that it would be difficult to obtain agreement from Chrysler to invest corporate funds in IPE because the equipment would have no commercial application and it would be installed in government owned plants. However, it was determined to investigate opportunities at the subcontractor level. As a result,

Chrysler was provided a draft clause for each of its two major subcontractors, AVCO Lycoming (engines) and Detroit Diesel Allison, Division of General Motors Corporation (transmissions). AVCO would have nothing to do with the plan, and Allison set forth the following conditions which were unacceptable to the government:

- (1) They wanted accelerated depreciation of four years rather than the normal twelve.
- (2) They wanted liquidated damages if the prescribed number of transmissions were not built in lieu of buy back.
- (3) They wanted to charge rent if the assets were not used to capacity.
- (4) They wanted no profit offsets on the WGL for risk reduction.

Although the initiative on IPE was abandoned and DAR 3-815 does not cover real property, the project office was able to obtain DOD approval to enter into a contractual arrangement with General Motors to invest in real property. The agreement stipulates that in the event a certain number of transmissions are not ordered as scheduled, the government will be liable to pay one-half the investment cost less amounts recovered for depreciations with consideration given quantities already delivered.

c. Viper Carborane Production Program.

In 1979 a requirement existed for a large quantity of N-HEXYL CARBORANE (NHC). Insufficient facilities existed for the production of required quantities of Diborane to support the NHC production capacity. In addition, there was no commercial market for such large amounts of Diborane should the government requirement decrease. This appeared to be a prime candidate for a special termination buy back provision, and negotiations

were in process to conclude agreement on the contents of the contract clause when the requirement for NHC was reduced by 50%. As a result, negotiations ceased, and the investment was never made. Had the reduction in requirement not been discovered until after the agreement was enacted and the facilities were in place, the contractor would have had to invoke the clause. This example, therefore, illustrates both the opportunities and pitfalls of applying this technique.

d. Fighting Vehicle System (FVS)

In 1979 the government entered into agreements with FMC Corporation (FMC) and General Electric Ordnance Systems (GEOS) for investment protection on the FVS program. Total investment by FMC and GEOS including real property and IPE with a unit cost less than \$10,000 was \$38.5 million and \$9.2 million respectively. The government accepted \$19.7 million and \$5.1 million contingent liability respectively in order to save \$56.1 million over 6,889 vehicles. The contingent liability reflected in this agreement is the highest amount ever negotiated under the purview of DAR 3-815. It is by far the most aggressive application of the technique to date within the Army, and is among the most successful applications of the special termination buy back provision within DOD.

Subsequent to reaching this agreement on investment protection, a program shortfall of \$97 million occurred on the FY 80 FVS program. In order to offset this dollar shortfall, FMC proposed to capitalize \$45 million worth of special tooling and special test equipment with the following conditions:

- (1) Advance payments of \$25 million per contract for four contracts.

- (2) Investment protection.
- (3) FMC ownership (tooling-test equipment).
- (4) Direct charge the tooling to FVS production.

Because of a lack of supporting data and an excessive return on investment, the proposal was rejected on 17 Jan 80. The FY 80 quantity of end items was consequently reduced to accommodate the shortfall.

Although agreement was not reached on the special tooling and special test equipment in the particular case, the technique was an innovative attempt to enlarge the scope of protection afforded by DAR 3-815. It appears as though DOD would have been agreeable to such protection had the circumstances been more favorable.

F. VALUE ENGINEERING (VE).

Of all the interviews held during the course of this study, only one application of VE for capital investment was discovered. The ROLAND project office currently has seventeen undefinitized Value Engineering Change Proposals (VECP's). Since the VECP's in essence recommend changes from European to American technology and processes, it is conceivable that any sharing the contractor receives could be used to acquire capital equipment. However there is no requirement for the contractor to account for the disposition of funds received as VE rewards.

Personnel interviewed generally commented that they failed to understand how VE could be used to incentivize capital investment unless a specific manufacturing process is required by the contract and a VECP would suggest a different technology. Even in that case, the reward would not necessarily have to be used for capital equipment because the originator of the VECP may already possess the required equipment.

G. AWARD FEE.

Investigation was unable to uncover any instance of utilization of award fee contracts specifically designed to incentivize capital investment. In addition to administrative problems relative to agreement on capital investment magnitude or necessity, the personnel interviewed generally believe that the total amount of funds available on an award fee basis would be small in relation to the funds required to make the investment.

H. MULTI-YEAR CONTRACTING.

Although multi-year contracts are being used, no use specifically for motivating capital investment was discovered. The prospect of predictable revenue stability does encourage limited investment; however, the \$5 million cancellation ceiling effectively limits the application of multi-year as an incentive for the large investments required for most system acquisitions.

I. GENERAL OBSERVATIONS.

During the course of this study, it quickly became apparent that there is a minimal amount of effort being taken to motivate contractor investment within the DARCOM field commands. The following circumstances are believed to be contributing to the lack of activity in this area:

1. Capital investment is currently being treated as a desired end, rather than a means to an end. The rationale for capital investment is that it will increase productivity and reduce cost; however, competition and many other techniques can also be used to achieve the same results. It appears that there is a widespread failure to recognize that a number of techniques can be used to achieve the same end, dependent on the conditions surrounding the acquisition. When capital investment strategies have been attempted, they were always a last resort effort to solve an immediate problem. They

have not been used as part of any comprehensive plan.

2. There is a lack of a firm DOD policy or program to attempt to stimulate contractor investment. The recommendations of the studies of 1976 have never become manifest in a coordinated program or guidance at any level in the military community. Operations personnel are unfamiliar with the provisions of DAR 3-815 and many admitted they have never even considered using value engineering or award fee provisions to stimulate contractor investment in capital.

3. Capital investment motivation, where attempted, has been tied to individual contracts without serious consideration of the contractor's environmental problems. Although capital investment is by nature a long run proposition, current initiatives (except for DAR 3-815) treat it as a short run problem.



CHAPTER V  
CONCLUSIONS AND RECOMMENDATIONS

A. CONCLUSIONS.

1. Capital Investment Determinants.

A firm's capital investment decisions will be influenced by a variety of factors, including the company's:

- a. nonoperational objectives;
- b. operational objectives;
- c. internal environment;
- d. decision rules in this regard; and
- e. external environment.

The first four factors are peculiar to a given firm, and it is difficult to draw any broad conclusions regarding their current effect on industry as a whole. The final factor is, of course, common to virtually every firm in the defense industrial base.

2. External Environmental Influences. The current state of the external environment is not conducive to capital investments. The US economy is plagued by seemingly chronic inflation which, in turn, has directly contributed to long-term profit decline, shortage of investment funding, and exceedingly high interest rates on debt capital. Inflation has also brought into question the efficacy of our current depreciation and tax policies in an era of ever-increasing capital replacement costs. Turning to non-economic factors, social programs have further complicated the situation by requiring the diversion of limited investment funding to areas which do not necessarily contribute to production efficiency. Additionally, companies often view the

government's social objectives as both contradictory and cumbersome.

Finally, the uncertainty regarding future social initiatives inhibits long-term investment in improved facilities. In sum, both economic and social factors are currently acting against capital investment, and any attempts to influence a company's investment decisions through government contracts must be viewed in light of this environment. That is, contractual initiatives are essentially attempts to make what may be an uneconomical decision more attractive.

3. Current Contractual Initiatives. In attempting to spur increased capital investment by defense contractors, the Army (as well as the other services) has relied primarily on the provisions of individual contracts. Available contractual tools include:

- a. WGL profit policy;
- b. Special termination buy back provisions;
- c. Multi-year contracting;
- d. Award fees; and
- e. Value engineering.

Each of these techniques is somewhat limited, and the criteria for application is rigid. The results of this research indicate very infrequent application of these provisions within DARCOM activities.

4. Effectiveness of Current Initiatives. As noted above, there has been very little real progress in incentivizing contractors to invest in capital equipment. Factors limiting the broader implementation of current procedures include:

- a. The overriding disincentives of the external environment;
- b. The short-term orientation of the overall contracting process;

- c. The restrictive nature of available contractual techniques;
- d. The absence of a clear Army-wide policy on contractor capital investment; and
- e. The resultant lack of understanding and application at the working level.

5. Outlook. Given these adverse factors, any attempts to incentivize capital investment will be limited. The thrust of any initiatives in this area must be to offset disincentives found to pervade the external environment, and this is no mean task at present. Nonetheless, it has been concluded that the Army's effectiveness in incentivizing contractor investment can be improved. The following recommendations are intended to facilitate such improvements.

B. RECOMMENDATIONS.

1. Contractual Initiatives.

a. It is recommended that a clear policy on incentivizing capital investment be articulated and promulgated to the field. At present there is no coherent policy, per se, but rather a seemingly disjointed array of individual techniques which may or may not be effective in motivating investment. The development of a broad, uniform policy in this regard would benefit both government contracting activities and their industrial counterparts in understanding the overall objectives of the Army's program. It is further recommended that the resultant policy provide guidance for answering the following pertinent questions:

(1) Should incentivizing capital investment be considered on a program and/or individual contract basis?

(a) What is the objective to be accomplished (e.g., reduced production costs)?

(b) What alternative strategies are available to accomplish this objective (e.g., rely on existent competition, generate competition, or incentivize capital investment)?

(c) Is incentivizing capital investment the best alternative under the circumstances?

(2) If capital investment is to be encouraged on this program/contract, what method will be most effective?

(a) What is the contractor's current situation (i.e., operational/non-operational objectives, internal/external environments)?

(b) What is the government's current situation (i.e., contractual/extra-contractual objectives, internal/external environments)?

(c) Will the Weighted Guidelines profit policy provide sufficient incentives for capital investment?

(d) If not, which alternative tactics should be considered (e.g., special termination buy back provisions or award fees)?

(e) Given the overall contractor/government situation, which alternative tactic is most likely to incentivize the contractor to invest in capital equipment?

Finally, in order to effectively implement this policy, it is recommended that additional training be provided to government personnel to complement the new initiative. This recommendation stems from the scant knowledge exhibited by field personnel during the interview phase of this research. The text of this report, together with the questions set forth above, could be used to develop instructional material in this regard. This training would go far in assuring uniform implementation in the field.

b. It is recommended that more latitude be provided with regard to application criteria for certain available techniques :

- (1) Special termination buy back provisions (DAR 3-815).
- (2) Multi-year contracting.

This would provide for a more flexible program and allow for the exercise of judgement in implementation. Other available techniques would require no specific alterations, but would benefit from increased emphasis. This could be accomplished via the training recommended in l.a., above.

c. It is recommended that the Army investigate the possibility of revising Section XV of the DAR to include capital investment aimed at improving a contractor's overall productive efficiency as an allowable indirect cost. DAR 15-205.21 recognizes Manufacturing and Production Engineering costs as being generally allowable under government contracts. By extension, it may be advisable to recognize the cost of implementing the results of these engineering efforts as being equally allowable. It is, however, felt that the criteria for allowability should be rather rigid. First, the contractor would have to demonstrate that any such costs would be incurred for the benefit of government business as a whole (as opposed to facilitization costs for an individual contract). Second, it is felt that advance agreements should generally be required to support the reasonableness of amounts incurred. Coverage approximating current coverage for IR&D/B&P costs is suggested. This approach would fill a current void in that it would address the firm's overall operation, rather than relying on a series of contractual instruments to incentivize capital investment. It would also insure that the government could provide general direction to the contractor's activities by agreeing on the military relevancy of each proposed project.

2. Extra-contractual Initiatives. A major conclusion of this study is that many factors in a firm's external environment affect any capital investment decision. A second conclusion is that current environmental conditions serve as disincentives to capital investment. Faced with these conditions, even the most aggressive contractual initiatives will have a limited impact. It is, therefore, recommended that the Army complement the contractual initiatives outlined above by actively supporting attempts to relax these environmental disincentives. For example, current proposed reforms in the area of taxes and depreciation might be supported. Similarly, initiatives to reduce paperwork and reporting requirements placed on contractors by other agencies could be supported. The point is that only by attacking the basic causes of productivity slippages can the Army create a climate in which incentives for capital investment can be effective.

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13. ABSTRACT The objectives of this study were to determine (1) the relationship between capital investment expenditure levels and productivity; (2) which conditions, if any, preclude WGL's from being a sufficient motivator; (3) the current use and success of multi-year procurement, award fee, value engineering, and special termination buy back provisions as motivators for capital investment; and to recommend alternative strategies and tactics which may be capable of stimulating contractor investment. It was concluded that a firm's capital investment decisions are influenced by the firm's operational and non-operational objectives, and by its internal environment and decision rules. The external environment which provides information needed for decision-making is influenced by the economy and government involvement. Government opportunities for initiatives are somewhat limited, application criteria are rigid, and they are infrequently used within DARCOM activities. The government initiatives are limited in effectiveness by disincentives in the external environment and the short-term orientation of the contracting process. It is recommended that a clear policy on capital investment be articulated and promulgated to the field. Additional training for government personnel should complement any policy issuance to assure uniform implementation. The Army should investigate the possibility of revising Section XV of the Defense Acquisition Regulation to include capital investment aimed at improving a contractor's overall production efficiency as being generally allowable as an indirect cost. The Army should support proposed reforms which are designed to make the business environment and contractual provisions more conducive to capital investment.		